

## LIWONDE DISTRICT OF SOUTHERN NYASALAND

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They are semi-subsistence cultivators who own no cattle and whose diet is therefore largely vegetarian, viz. sorghum and maize-meal with ground-nuts and beans and certain leaves together with a small quantity of cassava roots. 105

Marriages are contracted early in life with little difficulty and ceremony. Formerly 582 girls were espoused as mere children, and this still happens, but whether the custom is falling away or not I could not check quantitatively because the memories of the old women who had been married as children forty or fifty years ago could not be relied upon. Table I shows the ages at first marriage for a sample of 121 married women for whom this information was available.

Where marriage takes place so early we can expect that the mean age when child-bearing commences will also be early. Table II shows the median age of mothers at the birth of their first child. 163

TABLE II. *Age of Mother at Birth of First child*

| Present age-groups of mothers | Age of mother at birth of first child |       |       |       |       |       |       |       |       | Total | Median age at birth of first child |
|-------------------------------|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------------------------|
|                               | 14-15                                 | 16-17 | 17-18 | 19-20 | 21-22 | 23-24 | 25-26 | 27-28 | 29-30 |       |                                    |
| Under 20                      | 9                                     | 26    | 12    | 17    | 6     | 4     | 0     | 0     | 0     | 74    | 17.9                               |
| 20-25                         | 10                                    | 14    | 10    | 9     | 4     | 7     | 3     | 4     | 3     | 56    | 19.8                               |
| Over 25                       | 1                                     | 7     | 9     | 9     | 3     | 6     | 1     | 3     | 1     | 46    | 20.6                               |
| Total                         | 20                                    | 47    | 31    | 35    | 13    | 17    | 8     | 7     | 4     | 186   | 19.3                               |

From these two tables it is clear that nearly all women in the community are married early and that child-bearing commences very soon after marriage.

Table III shows the conjugal status of all women over the age of 15. 162

TABLE III. *Conjugal Status of all Women over the Age of 15*

| Present age-groups | Never married | Wives of    |             |                 | Divorced | Widows | Total |
|--------------------|---------------|-------------|-------------|-----------------|----------|--------|-------|
|                    |               | Monogynists | Polygynists | Labour migrants |          |        |       |
| Under 20           | 23            | 11          | 3           | 4               | 0        | 0      | 41    |
| 20-25              | 3             | 27          | 15          | 9               | 9        | 3      | 79    |
| 26-30              | 1             | 21          | 19          | 3               | 9        | 1      | 70    |
| Over 30            | 0             | 14          | 10          | 1               | 11       | 16     | 52    |
| Total              | 27            | 73          | 37          | 17              | 29       | 20     | 203   |

Here we see that of all women under 45 (194), 141 (73 per cent.) are married, though only 83 (43 per cent.), i.e. the wives of monogynists, have their husbands living permanently with them. Another 40 (20 per cent.) were married to men who were married to other wives, so that while their husbands were not living with them permanently they were nevertheless with them periodically. Eighteen other women (9 per cent.) were married to men who had left to work outside the area and hence were not living with their wives at all at the time of the survey. Visits by men to places of work outside the area may last a year or more. It should

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844 believe that she will die. The man's representatives are therefore able to establish the child's paternity from the birth-pang confessions of the woman.

846 The child is kept in the hut where it was born, for six or seven days, while the umbilical cord dries and falls off. During this time (and) the child is unnamed, and it is named only when it is taken out of the hut. Should it die during this period of seclusion it remains unnamed and is referred to by a special term (*liye*, pl. *matye*).

(128) I have therefore been able to enumerate live births by means of the distinction made between miscarriages and still-births (*kwazango*) and children who lived long enough to be referred to as *matye*. After the birth of the child the woman may not have intercourse for four or five months. To do so would be to endanger the life of the child with a disease called *adafa*,<sup>1</sup> which is contracted by a sexually inactive person

846 when he comes into contact with a sexually active person. The husband may have intercourse with a second wife, but must take care to medicate himself so that he does not endanger the life of his child. When the child is about 4 or 5 months of age the parents perform ritual intercourse and medicate the child against the mystical dangers of sexual activity; sexual relations are then resumed.

834 The Yao say that a second child should not be born while the first is still being suckled. Since lactation continues for about two years I am uncertain whether monogynists remain continent, as they say they do, or whether *civitas interrupta* is practised. It is quite usual for husbands to become labour migrants when their children are still very young. I have known women to write to their husbands who are away working and tell them to return because their children have 'grown', i.e. have been weaned. Labour recruiters had difficulty in recruiting men immediately after the soldiers had been demobilized at the end of the war, because the women objected, saying that they had remained childless long enough and the men must first wait until children were born. However, actual examination of birth-dates shows that children are sometimes born within a year of one another and sometimes there are quite big gaps. The two-year gap between children is probably an ideal which few attain.

## 3. THE ESTIMATION OF FERTILITY

## (a) Sundberg's Age Division

128 As a preliminary estimate of fertility, Sundberg's trichotomy of ages may be considered. The argument behind this division of the population into Youth, Middle Age, and Old Age is that those populations with a high proportion of youth have a greater tendency to increase. Table V shows this trichotomy for the Yao with the same material for some other populations shown for comparison. Where the gross reproduction-rate is known for the period shown in the table, this is included.

128 At any one time a certain proportion of the population is absent from the area, usually at some labour centre. Hence the proportions of the population are distributed abnormally. In all there appeared to be a total of sixty-three men, women, and children absent from the hamlets, who would otherwise have been living there. Hence in Table V these have been included in the totals in the 'Yao with absentees' proportions.

(171) <sup>1</sup> A disease of this sort is believed in by many Central African tribes. Among the Nyanja-speaking peoples it is known as *camphe*.

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Table V shows that the age-distribution for the Yao sample is very similar to certain other populations commonly held to have high birth-rates. There appears to be some correlation between the proportion of youth in a population and the gross

TABLE V. *Sandburg's Age Divisions*

| Population           | Year | Youth<br>0-13 | Middle age<br>13-43 | Old age<br>over 43 | G.R.R. |
|----------------------|------|---------------|---------------------|--------------------|--------|
| Yao*                 | 1946 | 43.4          | 43.6                | 11.0               | ..     |
| Yao with aboriginals | 1946 | 42.6          | 47.4                | 10.0               | ..     |
| Honduras†            | 1940 | 42.6          | 47.7                | 9.7                | ..     |
| Nicaragua            | 1940 | 42.9          | 47.7                | 9.6                | ..     |
| Guatemala            | 1940 | 43.6          | 46.9                | 9.3                | ..     |
| India                | 1931 | 39.9          | 50.4                | 9.7                | ..     |
| Japan                | 1933 | 36.9          | 47.9                | 15.3               | 2.193  |
| Belgium              | 1934 | 34.4          | 49.4                | 15.3               | 1.70   |
| Czechoslovakia       | 1930 | 36.3          | 54.3                | 19.3               | 1.33   |
| New Zealand          | 1936 | 33.3          | 54.7                | 21.3               | 1.04   |
| Denmark              | 1940 | 24.0          | 54.1                | 21.0               | 1.08   |
| Sweden               | 1940 | 20.4          | 54.8                | 24.6               | 0.89   |

\* There were 43 in the sample whose ages were not known. These were all adults and have been included separately in the two adult groups.

† All data for other populations taken from *The League of Nations Statistical Yearbook 1942/44*.

‡ Interpolated between 1930 (2.193) and 1937 (2.141).

reproduction-rate. Judging from the material presented in Table V a high gross reproduction-rate may be expected among the Yao where the proportion of youth is much higher than in the case of those whose gross reproduction-rates are quoted.

(b) *The Proportion of Children under 5 to Women 15-50*

Fertility may be judged more accurately than by this trichotomy by considering the proportion of children under 5 to the total number of women between the ages of 15 to 50, i.e. the fertility ratio.<sup>1</sup> In the whole sample there were 147 children under 5 and 191 women between the ages of 15 to 50. This is a ratio of 766 children per 1,000 women. However, women who are going away from the area for a long time, as, for example, wives of men who are going with their husbands to some labour centre, possibly in South Africa or Southern Rhodesia, usually leave their weaned children with their matrilineal relatives. This means that the ratio quoted (766 per 1,000) is, in reality, an over-estimate of the true ratio. In order to arrive at a nearer estimate of the ratio we must consider the children actually born to women in the sample. Table VI classifies all children both dead and surviving born to women between the ages 15 to 55. From this table we adduce that there were 191 women between the ages 15 to 50 (for whom details were available), and among them they had 141 surviving children under the age of 5. This is a fertility ratio of 738 per 1,000 women. Table VII shows the fertility ratio for 18 countries with their gross reproduction-rate for the same period as the fertility ratio.

<sup>1</sup> It is more usual to take the number of women between 15 and 44, though recently the age-group between 20 and 44 has been used. I have taken the age-limit 15 to 50 because of the early age of marriage, and because it is assumed that the average age of cessation of child-bearing is about 50 (see

Table VIII). For a discussion of the suitability of this measure of fertility when birth registration is not provided, see T. Lynn Smith, *Population Analysis*, McGraw Hill Book Co., New York (1948), p. 198.

300 AN ESTIMATE OF FERTILITY IN SOME YAO HAMLETS IN  
TABLE VI. *Live-born Children, Alive or Dead at Time of Survey. Mothers aged 15 to 55*

| Age of mothers at time of survey | Mothers | Alive or dead | Number of years elapsed since birth of child |       |       |       |       |       |       |       | Totals |     |
|----------------------------------|---------|---------------|----------------------------------------------|-------|-------|-------|-------|-------|-------|-------|--------|-----|
|                                  |         |               | 17-9                                         | 30-4  | 27-9  | 20-4  | 17-25 | 10-24 | 7-9   | 0-6   |        |     |
|                                  |         |               | ♂ ♀                                          | ♂ ♀   | ♂ ♀   | ♂ ♀   | ♂ ♀   | ♂ ♀   | ♂ ♀   | ♂ ♀   | ♂ ♀    | ♂ ♀ |
| 15-19                            | 8       | A             | .. 1                                         | 2 2   | .. 4  | 3 6   | 6 2   | 1 1   | 2 2   | .. 2  | 14     | 20  |
|                                  |         | D             | .. ..                                        | .. .. | 1 1   | 1 4   | .. 1  | .. .. | 1 1   | .. .. | 3      | 7   |
| 20-24                            | 9       | A             | .. ..                                        | 2 ..  | 4 3   | 3 1   | 2 4   | 1 3   | 3 2   | 2 ..  | 17     | 17  |
|                                  |         | D             | .. ..                                        | .. .. | 1 ..  | 3 1   | 1 3   | .. 1  | .. .. | .. .. | 7      | 5   |
| 25-29                            | 22      | A             | .. ..                                        | .. 1  | 4 4   | 9 7   | 10 11 | 4 3   | 8 9   | 3 7   | 40     | 42  |
|                                  |         | D             | .. ..                                        | .. .. | 1 2   | 2 2   | 1 3   | 2 ..  | .. .. | 1 1   | 7      | 8   |
| 30-34                            | 18      | A             | .. ..                                        | .. .. | .. 1  | 2 3   | 3 8   | 6 3   | 7 12  | 6 8   | 26     | 31  |
|                                  |         | D             | .. ..                                        | .. .. | .. .. | 1 1   | .. 3  | .. 1  | 1 ..  | 1 1   | 5      | ..  |
| 35-39                            | 29      | A             | .. ..                                        | .. .. | .. .. | .. .. | 4 7   | 8 8   | 8 15  | 16 9  | 36     | 39  |
|                                  |         | D             | .. ..                                        | .. .. | .. .. | .. .. | .. .. | 1 2   | 3 1   | 2 ..  | 6      | 3   |
| 40-44                            | 51      | A             | .. ..                                        | .. .. | .. .. | .. .. | 1 1   | 3 12  | 23 19 | 21 31 | 30     | 63  |
|                                  |         | D             | .. ..                                        | .. .. | .. .. | .. .. | .. .. | 1 3   | 2 1   | 4 1   | 7      | 5   |
| 45-49                            | 28      | A             | .. ..                                        | .. .. | .. .. | .. .. | .. .. | .. 1  | 3 2   | 11 17 | 16     | 20  |
|                                  |         | D             | .. ..                                        | .. .. | .. .. | .. .. | .. .. | .. .. | 1 1   | 1 1   | 2      | 2   |
| 50-54                            | 34      | A             | .. ..                                        | .. .. | .. .. | .. .. | .. .. | .. .. | .. 1  | 3 3   | 3      | 4   |
|                                  |         | D             | .. ..                                        | .. .. | .. .. | .. .. | .. .. | .. .. | .. .. | 1 1   | 1      | 1   |
| 55-59                            | 11      | A             | .. ..                                        | .. .. | .. .. | .. .. | .. .. | .. .. | .. .. | .. .. | ..     | ..  |
|                                  |         | D             | .. ..                                        | .. .. | .. .. | .. .. | .. .. | .. .. | .. .. | 1 ..  | 1      | ..  |
| Totals                           | 210     | A             | .. 1                                         | 4 3   | 8 13  | 17 17 | 28 33 | 25 33 | 36 63 | 66 77 | 204    | 240 |
|                                  |         | D             | .. ..                                        | .. .. | 3 3   | 9 8   | 2 10  | 4 7   | 8 4   | 11 5  | 37     | 37  |

\* Excludes one woman whose children were not in the hamlet so that their ages could not be determined.

TABLE VII. *Fertility Ratios and Gross Reproduction-rates for Eighteen Countries\**

| Country        | Year   | Fertility ratio† | G.R.R. |
|----------------|--------|------------------|--------|
| (Yao).         | (1946) | (758)            | ..     |
| Japan          | 1930   | 374              | 2.30   |
| Chile          | 1930-2 | 328              | 2.26   |
| Bulgaria       | 1934-5 | 477              | 1.70   |
| Poland         | 1931-2 | 462              | 1.71   |
| Union of S.A.  | 1941   | 423              | 1.49   |
| Portugal       | 1940-1 | 416              | 1.34   |
| Italy          | 1933-7 | 400              | 1.43   |
| Canada         | 1941   | 357              | 1.38   |
| Czechoslovakia | 1930   | 342              | 1.22   |
| Australia      | 1933   | 337              | 1.05   |
| Norway         | 1930-1 | 322              | 1.43   |
| Finland        | 1930-2 | 322              | 1.21   |
| Denmark        | 1940   | 322              | 1.08   |
| France         | 1936   | 319              | 1.00   |
| New Zealand    | 1936   | 299              | 1.04   |
| U.S.A.         | 1940   | 293              | 1.03   |
| Switzerland    | 1941   | 259              | 1.06   |
| Sweden         | 1940   | 255              | 0.90   |

\* From The League of Nations Statistical Yearbook 1942/44. Only those countries which showed gross reproduction-rates based on direct census data and in which reliable age-groupings were used.

† I have used the age-limits 15-50 in these calculations.

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There is, as one would expect, a close association of the fertility ratio with the gross reproduction-rate. In fact, the product moment correlation coefficient for this series of data is  $+0.96 \pm 0.02$ . By fitting a straight line to the series of points it is possible to make an estimate of what we could expect the Yao gross reproduction-rate to be on the basis of a fertility ratio of 738. When this is done, the expected gross reproduction-rate falls between 2.99 and 2.47.<sup>1</sup> It is not suggested that this figure is a reliable estimate, since the mortality rate in the first five years of life must affect the association between the two measures. There are almost certainly differences in this respect between the relatively advanced countries, used to derive this estimate, and the people with whom this paper is concerned. This estimate is used here merely to check the estimate of the gross reproduction-rate arrived at by other means, basing such procedure on the assumption that differences in child mortality are not sufficient seriously to upset the correlation.

(c) *The Number of Children born to Mothers*

Table VIII shows the number of children born alive to women in the sample by age-groups. The Culwicks, in their survey of population in Ulanga District in

TABLE VIII. *Numbers of Live-born Children to Women of All Ages*

| Age group | No.  | 0  | No. of live-births |    |    |    |    |    |    |    |    |     | Totals |     |     | Rate per woman |      |      |
|-----------|------|----|--------------------|----|----|----|----|----|----|----|----|-----|--------|-----|-----|----------------|------|------|
|           |      |    | 1                  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10+ | Σ      | Q   | T   | Σ              | Q    | T    |
| 15-14     | 11   | 10 | 1                  | .. | .. | .. | .. | .. | .. | .. | .. | ..  | 1      | ..  | 1   | 0.09           | 0.00 | 0.09 |
| 15-19     | 34   | 26 | 3                  | 3  | .. | .. | .. | .. | .. | .. | .. | ..  | 6      | 5   | 11  | 0.18           | 0.15 | 0.33 |
| 20-4      | 28   | 5  | 11                 | 8  | 3  | 1  | .. | .. | .. | .. | .. | ..  | 18     | 22  | 40  | 0.64           | 0.79 | 1.43 |
| 25-9      | 31   | 9  | 12                 | 6  | 8  | 9  | 4  | 2  | .. | .. | .. | 1   | 37     | 68  | 125 | 1.12           | 1.32 | 2.44 |
| 30-4      | 29   | 3  | 5                  | 4  | 6  | 5  | 4  | 1  | 1  | .. | .. | ..  | 42     | 42  | 84  | 1.45           | 1.45 | 2.90 |
| 35-9      | 19   | .. | 1                  | 4  | 2  | 7  | 1  | 3  | .. | 1  | .. | ..  | 30     | 44  | 74  | 1.58           | 2.32 | 3.90 |
| 40-4      | 22   | .. | 1                  | 3  | 5  | 3  | 1  | 3  | 4  | .. | .. | ..  | 47     | 50  | 97  | 2.14           | 2.27 | 4.41 |
| 45-9      | 9    | .. | 2                  | .. | 2  | 1  | .. | 1  | .. | 1  | 1  | 1*  | 24     | 22  | 46  | 2.67           | 2.45 | 5.12 |
| 50-4      | 8    | .. | 1                  | 1  | .. | 1  | 1  | 1  | 1  | .. | 1  | 1†  | 17     | 27  | 44  | 2.13           | 3.38 | 5.51 |
| 55-9      | 8    | .. | ..                 | 1  | 1  | 2  | 1  | .. | 1  | .. | 1  | 1‡  | 18     | 27  | 45  | 2.25           | 3.38 | 5.63 |
| 60-4      | 9    | 1  | ..                 | 2  | 1  | .. | 2  | .. | 1  | 1  | 1  | ..  | 16     | 25  | 41  | 1.78           | 2.78 | 4.56 |
| 65-9      | 12   | .. | ..                 | 1  | 1  | 3  | .. | 1  | .. | 2  | 1  | 3   | 36     | 44  | 80  | 3.00           | 3.66 | 6.66 |
| 70        | 6    | 1  | ..                 | .. | 1  | .. | 2  | 1  | 1  | .. | .. | ..  | 14     | 12  | 26  | 2.34           | 2.00 | 4.34 |
| Total     | 246§ | 55 | 39                 | 35 | 30 | 32 | 26 | 15 | 9  | 5  | 6  | 6   | 326    | 388 | 714 | 1.52           | 1.58 | 2.90 |

\* Eleven live births.

† Ten live births.

‡ Eleven live births.

|| Two mothers with

ten live births and one with twelve live births.

§ Excludes six women whose ages are unknown.

Tanganyika Territory, calculated the average number of live births per woman at various ages. These were as follows (Yao figures for comparison):

|          | Ulanga | Yao  |
|----------|--------|------|
| Under 20 | 0.92   | 0.27 |
| 20-30    | 1.99   | 2.07 |
| 30-40    | 2.49   | 3.82 |
| Over 40  | 3.13   | 5.50 |

This seems to support their conclusion that the birth-rate had suffered during the

<sup>1</sup> The equation for the regression line is  $X = 0.015 + 0.0037 Y$ , where  $X$  is the G.R.R. and  $Y$  the fertility ratio. The standard error of the estimate

is 0.15. A range of two standard errors was used in this estimate.

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- 163 last twenty to thirty years, and that it was then returning to normal since the  
 171 number of live births in the under-30 age-groups agree in the two surveys, but the figure for the over-30 age-groups is substantially lower for the Tanganyika material than for the Yao.

114 The Culwicks, Fortes, and Schapera have used the number of live females born  
 128 to women past child-bearing as an indicator of the gross reproduction-rate. It was  
 163 not possible to record whether the women in this sample had passed the menopause or not. From Table VIII we see that there is no upward trend in live births per woman over the age of 50. We may therefore take this age as representing the age at which child-bearing ceased. There were 43 women over the age of 50 and they had between them borne 133 live females. This is an average of 3.13 per female.  
 (171) This differs substantially from the figure that the Culwicks arrive at in their study, viz. 1.56.<sup>1</sup> It agrees, however, with the estimates made for the Tallensi (3.1)<sup>2</sup> and for the Tswana (2.54).<sup>3</sup>

There are, however, some serious objections to the use of this figure as a measure of the prevailing gross reproduction-rate. First, it does not take into account those mothers who did not survive the child-bearing period. If it is only the most fecund who die before menopause, we are, in fact, dealing with a sample which is unrepresentative, in that the least fecund are automatically selected. The opposite may also be true, of course, but the fact remains that such an estimate is based on an unrepresentative sample of mothers. Second, it represents the average fertility prevailing over the last fifty or sixty years. If there has been a large change in the fertility at some time during this period, this is included in the average and obscures the rate which prevails now. For example, the material presented by the Culwicks shows that the gross reproduction-rate must be higher than 1.56. The low figure in this case, they suggest, is caused by the famine which followed a rebellion in 1906.

(d) *A More Direct Estimate of Fertility*

- 128 In order to arrive at a figure which would reflect conditions prevailing more  
 163 recently, a series of tables was constructed, which showed (according to my census sheets) the number of children born in each year between 1917 and 1946, and the number of women in the different five-year age-groups for each of those years. Hence each woman who appeared in the first year (1917) was also counted in 1918. As each new year was considered some had turned 50 and were excluded, and others had turned 15 and were included. Therefore a gross reproduction-rate was calculated for each year from 1917 to 1946. These rates were averaged by adding together the number of women shown in each five-year age-group for five years and adding the number of children born during those five years, and by dividing to arrive at average specific fertility rates. The five-year averages were as follows:

|                   |      |                   |      |
|-------------------|------|-------------------|------|
| 1917-21 . . . . . | 4.28 | 1932-6 . . . . .  | 2.23 |
| 1922-6 . . . . .  | 3.33 | 1937-41 . . . . . | 3.22 |
| 1927-31 . . . . . | 3.12 | 1942-6 . . . . .  | 2.83 |

There appears to have been a definite trend in this series, falling from the end of the

<sup>1</sup> The total of 3.13 children per woman was divided by 2 in order to arrive at the number of females per woman.

<sup>2</sup> M. Fortes, op. cit., p. 108.

<sup>3</sup> I. Schapera, op. cit., p. 23.

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last war to a trough in 1932-6 and then beginning to rise again. However, with a sample as small as this one, and since we are relying on memory for most of this information, it would be unwise to accept this as significant. These tables have in turn been combined into three tables each covering one ten-year period from 1917 to 1946. These are shown in Table IX.

TABLE IX. *Average Gross Reproduction-rates in Ten-year Periods since 1917 to 1946*

| Ages of women | 1917-26       |                          |                                        | 1927-36      |                          |                                        | 1937-46      |                          |                                        |
|---------------|---------------|--------------------------|----------------------------------------|--------------|--------------------------|----------------------------------------|--------------|--------------------------|----------------------------------------|
|               | No. of women* | No. of live-born females | Annual average specific fertility rate | No. of women | No. of live-born females | Annual average specific fertility rate | No. of women | No. of live-born females | Annual average specific fertility rate |
| 15-14         | 89            | 3                        | 0.036                                  | 168          | 6                        | 0.036                                  | 146          | 2                        | 0.014                                  |
| 15-19         | 175           | 13                       | 0.074                                  | 337          | 28                       | 0.083                                  | 339          | 21                       | 0.062                                  |
| 20-4          | 129           | 11                       | 0.085                                  | 225          | 18                       | 0.080                                  | 397          | 39                       | 0.096                                  |
| 25-9          | 79            | 10                       | 0.127                                  | 175          | 13                       | 0.074                                  | 337          | 39                       | 0.116                                  |
| 30-4          | 71            | 11                       | 0.155                                  | 129          | 10                       | 0.079                                  | 225          | 24                       | 0.107                                  |
| 35-9          | 94            | 13                       | 0.138                                  | 79           | 6                        | 0.076                                  | 175          | 10                       | 0.057                                  |
| 40-4          | 91            | 10                       | 0.110                                  | 71           | 3                        | 0.042                                  | 129          | 9                        | 0.070                                  |
| 45-50†        | 39            | 3                        | 0.077                                  | 94           | 3                        | 0.033                                  | 79           | 6                        | 0.076                                  |
| Totals        |               |                          | 0.822                                  |              |                          | 0.523                                  |              |                          | 0.598                                  |
| G.R.R.        | 4.110         |                          |                                        | 2.613        |                          |                                        | 2.990        |                          |                                        |

\* This does not mean that these totals represent the size of the sample. This is an average rate and some women have been counted more than once.

† These rates are higher than might be expected. There appears to be no special reason why these rates should be so high, and the explanation probably lies in the smallness of the sample.

The obvious deficiency in this set of data is that the women who died are not included, and since many more of the 1917-21 cohort (i.e. those women who were in the child-bearing ages in that period) have died than, say, for the 1937-41 period, the rates calculated for earlier periods become more and more unreliable. There seems

TABLE X. *Average Gross Reproduction-rates over Ten-year Period 1937-46*

| Age groups | 1937-41 |       |       | 1942-6 |       |       | 1937-46 |       |       |
|------------|---------|-------|-------|--------|-------|-------|---------|-------|-------|
|            | Women   | Girls | Rate  | Women  | Girls | Rate  | Women   | Girls | Rate  |
| 15-14      | 60      | ..    | ..    | 68     | 2     | 0.029 | 128     | 2     | 0.016 |
| 15-19      | 198.5   | 13    | 0.065 | 144    | 8     | 0.056 | 342.5   | 21    | 0.061 |
| 20-4       | 201     | 14    | 0.070 | 195    | 23    | 0.122 | 396     | 39    | 0.098 |
| 25-9       | 142     | 18    | 0.127 | 202    | 21    | 0.104 | 344     | 39    | 0.116 |
| 30-4       | 96      | 12    | 0.125 | 136.5  | 12    | 0.088 | 232.5   | 24    | 0.106 |
| 35-9       | 95      | 3     | 0.033 | 94     | 6     | 0.064 | 189     | 11    | 0.058 |
| 40-4       | 43      | 3     | 0.070 | 86.5   | 3     | 0.038 | 129.5   | 8     | 0.062 |
| 45-50      | 27      | 4     | 0.108 | 42     | 2     | 0.048 | 79      | 6     | 0.076 |
| Totals     |         |       | 0.618 |        |       | 0.365 |         |       | 0.593 |
| G.R.R.     | 3.090   |       |       | 2.225  |       |       | 2.965   |       |       |

no way of circumventing this difficulty for the earlier periods, but some correction for this may be included in the 1937-46 rates. All those women who were in the child-bearing ages when they died between 1937 and 1946 were extracted and

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128 included in the material that was prepared for Table IX. In this way it was possible  
163 to construct Table X which shows as close an approximation as we can get to the gross reproduction-rate from the material on hand.

Since the exact date of death was unknown (i.e. day and month) it was assumed that at death the women were at the mid-point of the age-group. Therefore the figure 198.5 in Table X represents, for example, say, 198 women who passed through one particular year and 1 woman who died in that year.

The revised rates for the two five-year periods 1937-41 and 1942-6 are not greatly different from those calculated without taking account of the women who died. The average gross reproduction-rate over the ten-year period 1937-46 falls within the limits of expected gross reproduction-rate as calculated from the fertility ratio (2.47 to 2.99; see p. 303), and is not widely different from the estimate derived from women who have passed child-bearing (3.15; see p. 304).

(a) *General Conclusions about the Gross Reproduction-rate*

163 In general we may observe that from the material on hand the gross reproduction-rate for this sample has always been high. This is confirmed since, first, the number of live-born females born to women over the age of 30 is high (3.15); second, the lowest rate calculated for the past is 2.23 for 1932-6, though not too much reliance should be placed on the validity of this; and third, the rate calculated for the last five years which, since memories of dead children would still be fresh, is probably quite accurate, is 2.83.

114 With a sample as small as the one used in this survey a certain amount of variability  
163 is to be expected. Also since all ages are merely estimations based on the memory of informants, one can only expect approximations over fairly long periods of time. For this reason it is probably safer to use the five-year average 1942-6 as an indicator of the present gross reproduction-rate, or even the ten-year average 1937-46. In this case, we may estimate the present gross reproduction-rate at about 2.8 or 2.9.

## 4. THE NET REPRODUCTION-RATE

128 Of course, no mortality statistics for the African population are available. Hence  
165 it is necessary to construct a make-shift survival table in order to arrive at some estimate of the net reproduction-rate. This is set out in Table XI. In this table I have assumed that the mean age of each five-year group is 5 years older than the lowest age in that group, i.e. the mean age of the 35-9 age-group is 38. It would have been more consistent to take this mean to be 37.5, but since the ages at death are not accurately known there seemed little point in doing this.

The problem then becomes: what proportion of girls born to mothers of average age 28 years (for example), i.e. to the 25-9-year age-group, will themselves survive to be 28 years of age?

In order to arrive at this proportion all the girls born between 1934 and 1945 who were recorded on family census forms were abstracted, i.e. 151. Of these 16 died before reaching the age of 4, so that we can assume that 89 per cent. survived to the age of 4 and over. For the mortality of the children between 4 and 8, those born between 1929 and 1938 were considered. There were 112 of these, but 14 died before reaching the age of 4. Hence we consider only 98 (as recorded in column iii

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of Table XI) as surviving to the age of 4 and beyond. Of these, 2 died before they turned 8 (see column v) which indicates a survival of 98 per cent. for this period. It will be remembered that 89 per cent. of all girls born alive survived to be 4 years old, and now we know that 98 per cent. of these lived to be 8 years old. Hence,

TABLE XI. *Survival Table: Females*

| <i>Year of birth of females</i> | <i>Age-groups through which females have entered and passed (except if died)</i> | <i>No. of females entering age-groups</i> | <i>No. of females who died before passing out of age-group</i> | <i>No. of females who survived through age-group</i> | <i>Per cent. of females who survived age-groups</i> | <i>Survival-rate</i> | <i>Smoothed values</i> |
|---------------------------------|----------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|----------------------|------------------------|
| i                               | ii                                                                               | iii                                       | iv                                                             | v                                                    | vi                                                  | vii                  | viii                   |
| 1954-45                         | 5 and under                                                                      | 151                                       | 16                                                             | 135                                                  | 89                                                  | 89                   | 92                     |
| 1949-50                         | 4 " 8                                                                            | 98                                        | 1                                                              | 97                                                   | 98                                                  | 87                   | 86                     |
| 1944-55                         | 9 " 13                                                                           | 65                                        | 1                                                              | 64                                                   | 98                                                  | 85                   | 84                     |
| 1939-48                         | 14 " 18                                                                          | 70                                        | 3                                                              | 67                                                   | 96                                                  | 81                   | 83                     |
| 1934-53                         | 19 " 23                                                                          | 66                                        | 0                                                              | 66                                                   | 100                                                 | 81                   | 82                     |
| 1909-18                         | 24 " 28                                                                          | 44                                        | 0                                                              | 44                                                   | 100                                                 | 81                   | 81                     |
| 1904-13                         | 29 " 33                                                                          | 28                                        | 1                                                              | 27                                                   | 96                                                  | 77                   | 77                     |
| 1899-1908                       | 34 " 38                                                                          | 15                                        | 1                                                              | 14                                                   | 93                                                  | 71                   | 71                     |
| 1894-1903                       | 39 " 43                                                                          | 11                                        | 1                                                              | 10                                                   | 91                                                  | 64                   | 66                     |
| 1889-98                         | 44 " 48                                                                          | 10                                        | 0                                                              | 10                                                   | 100                                                 | 64                   | 63                     |

we can say that  $89 \times 98 = 87$  per cent. of all children survive to be 8 years old (see column vii of Table XI). These points were then plotted and the curve smoothed by hand. Smoothed values for the mean ages, i.e. for 17.5, 22.5, &c., were then read off and are recorded in column viii of Table XI. These smoothed values represent the survival-rate over the last 15 years and may now be applied to the gross reproduction-rate for roughly the same period, i.e. for the period 1937-46 in Table IX. This is done in Table XII.

TABLE XII. *Net Reproduction-rates: Average 1937-46*

| <i>Age-group</i>      | <i>Specific fertility rates</i> | <i>Survival rates</i> | <i>Survival fertility rates</i> |
|-----------------------|---------------------------------|-----------------------|---------------------------------|
| i                     | ii                              | iii                   | iv                              |
| 15-14                 | 0.080                           | 0.84                  | 0.067                           |
| 15-19                 | 0.305                           | 0.85                  | 0.255                           |
| 20-4                  | 0.490                           | 0.82                  | 0.400                           |
| 25-9                  | 0.580                           | 0.81                  | 0.470                           |
| 30-4                  | 0.550                           | 0.77                  | 0.409                           |
| 35-9                  | 0.290                           | 0.71                  | 0.205                           |
| 40-4                  | 0.310                           | 0.66                  | 0.205                           |
| 45-9                  | 0.580                           | 0.65                  | 0.240                           |
| Net reproduction-rate |                                 |                       | 2.249                           |

The sum of column iv in Table XII (2.2) is the net reproduction-rate. This figure is admittedly high, and we may look for the error in the possibility that some females who died are not recorded so that the mortality rate is underestimated. However, there seems to be sufficient evidence to conclude that the replacement rate is high.

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(161) This is partly confirmed by the fact that the increase in total population for parts of the Liwonde district, with which this survey was concerned, according to the official census, is about 2.69 per cent. per annum.<sup>1</sup> At this rate we could expect the population to double itself in about 26 years. A net reproduction-rate of 2 would mean that the population would double itself in one generation which we may take in this case to be about 23 years. Some of the increase shown in the census is no doubt due to immigration from Portuguese East Africa, but the high replacement rate suggested by this material tends to confirm the opinion of one Administrative official, who maintained that immigration has virtually ceased since 1931.

## j. GENERAL SUMMARY AND CONCLUSION

From material collected in three groups of hamlets in Liwonde district of Southern Nyasaland it appears that the average gross reproduction-rate within the sample over the last ten years was about 2.9 while the net reproduction-rate was about 2.2.

(114) There is no reason to suppose that the fertility of this sample is vastly different from that in any other part of the district, since the hamlets visited were casually selected; nevertheless, the sample is not a random one (in the statistical sense) and it is unsafe to generalize from it.

The Nyasaland Administration has only recently introduced machinery for the registration of births and deaths.<sup>2</sup> Until, therefore, these statistics are collected there seems to be no alternative but to rely on estimates as uncertain as those made in this paper.

<sup>1</sup> The population of Kawinga, Liwonde, and Nyambi sections of what was formerly known as Liwonde district or Upper Shire District of Nyasaland, increased from 39,134 in 1926 to 64,840 in 1945. Extracted from the crude census returns in the D.C.'s office in Zomba.

<sup>2</sup> Actually the forms for this registration do not tabulate all the categories of information necessary

for the calculation of the gross and net reproduction rates. Such omissions are mainly of the ages of the mothers and ages at death, and they have been excluded, no doubt, because it is assumed that this information is unobtainable. It is to be hoped, however, that when the system has become established, these categories will be introduced.

*Résumé*

## MALÉDICTIONS DES NUER (see p. 289)

(500) L'AUTEUR cite de nombreux exemples des malédictions employées parmi les Nuer et indique l'importance comparative s'y attachant, suivant le degré de parenté entre la personne qui prononce la malédiction et celle à laquelle elle est destinée. La malédiction des morts est plus redoutée que celle des vivants, et l'on s'attend à ce qu'un homme qui emporte au tombeau le sentiment d'avoir subi une injustice fasse à son ennemi du mal affligant plusieurs générations. Des malédictions prononcées n'affecteront que rarement le bétail puisque faire du mal au bétail nuit à toute la lignée et pas seulement à l'individu. Pour être efficaces, les malédictions n'ont pas besoin d'être exprimées en paroles — une imprécation silencieuse, ou même un sentiment de dépit, peuvent avoir la même force qu'une malédiction prononcée.